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THE PLANNING OF MANURIAL EXPERIMENTS.

BY M. BARROWCLIFF.

Paper submitted to Batavia Rubber Congress.

As yet practically no attention has been paid in Malaya to the question of the fertilising of rubber, the prevailing view amongst planters being that the soils, being new, are not likely to require manuring for many* years to come, rubber not being an exhausting crop; and that fertilising, once started, must be continued in perpetuity if even the original yield is to be maintained. Whether any rational foundation exists for the latter belief the writer will not now discuss, but it has certainly not been derived from experience with Hevea.

It is however beginning to be found that of the older trees the yields are not being maintained and that bark renewal is less vigorous than formerly, and the time at which the question now under discussion will be generally taken up seems now not far away.

Considering the slight expense involved in carrying out experiments on a small scale, and the ease with which they can be so designed as to shew precisely which particular ingredients are lacking in the soil in question, whether financial benefit is likely to result from their general application, and the effect on the subsequent renewal of bark, it is indeed surprising to find that with one or two meritorious exceptions practically none have been initiated.

In contributing to a discussion on the subject the writer is at some disadvantage, inasmuch as the experiments for which he is responsible are not, at the time of writing, sufficiently advanced for the results to be made full use of. At the same time he is of the opinion that at the present juncture it is of greater importance to decide upon the principles that should underlay the designing and carrying out of manurial trials, to indicate the probable sources of error, and finally to endeavour to stimulate the initiation of trials

on a general scale than it is to discuss isolated results; such results may indeed be of general application but this must not be assumed, nor regarded as proved until wide-spread experiments have been made.

The present paper represents an expression of opinion as to the way in which fertilizing trials on rubber should be carried out, based mainly on the mistakes the writer is himself conscious of having made and partly on those he believes himself to have discerned in the reported results of others.

The size of each plot it is suggested should be not less than two acres, and the tapping of each the work of one and the same cooly throughout the course of the experiment. The trees in the area selected should be as far as possible of the same age and should have similar tapping and cultivation histories.

Even after taking the greatest care in the selection it will be found that appreciable, often considerable, differences exist in the yields afforded by the different plots, and it is therefore regarded as a matter of the utmost importance that a record should be kept of the yields for at least six months, preferably a year, before the application of any manure whatsoever. By this method comparison is obtained not only of the difference between the manured and the unmanured plots but also of the effect of the fertilisers on the yields of the individual plots themselves; and, especially if the results are then expressed in the form of graphs, say shewing the weekly outputs, a much more accurate view is obtained of the extent and duration of the action of the manure than if the usual procedure alone is followed.

As an instance of the necessity of adopting the above plan an experience may be cited in which the difference in yield between the highest and lowest of six plots, all adjacent and of the same number of trees, was no less than 20% over a period of six months. Now supposing that these two plots had been assumed to be exactly comparable, as there was seemingly every reason for so doing, and that a fertiliser actually capable of bringing about a 20% increase in yield was applied to one, the other remaining as a control, it is seen that its apparent action would be either to have no effect at all or to produce a 40% increase, according to which plot it happened to be applied.

Amongst the few manual experiments that, as far as the writer's knowledge goes, have been carried out on estates, a considerable percentage have resulted in the control plots affording a higher yield than those manured, and in further experimentation being discredited, a state of affairs very probably brought about in the way just described.

As a degression the writer may be perhaps permitted to express his opinion that the discrepancies between the results of tapping experiments reported from different stations, no two of which seem to agree, may be due to the same cause also; and to suggest that in future work the yields produced by making one cut only should be recorded for a considerable period before the variations it is desired to test are introduced.

The next point it is desired to emphasise is that whenever possible a mechanical and chemical analysis of the soil should precede the initiation of the experiments.

It not infrequently happens that the Agricultural Chemist is called in to prescribe a manure for an estate or a backward portion of it when examination shews the cause of the poor yield to be far more fundamental than a deficiency in any of the plant nutrients; that, owing to deficient drainage, to the presence of a hard pan or laterite at shallow depth, or to the soil itself being of a heavy, impermeable texture, root development is checked and the tree unable to avail itself of essential elements which may be indeed present in abundant quantity.

In such cases, without first taking the specific measures of improvement required in the particular case the application of artificial fertilisers could only result in disappointment and loss.

For these reasons it is desirable, and is in the Federated Malay States Agricultural Department insisted upon, that the Chemist should himself inspect the land it is proposed to treat, in order that, as far as possible, all the factors bearing on the problem may be estimated.

Furthermore it should be remembered that it is only when full information regarding the soils is available that experience derived in one place can, with any prospect of success, be applied to another; in fact without this knowledge intelligent interpretation of any results, positive or negative, is difficult, if possible at all.

Great caution should be exercised by planters in applying on any considerable scale a fertiliser represented to have been successful elsewhere, and on the other hand no one should be deterred by the failure of others from making trials for himself.

The following plan of experiment is put forward as being one from which the maximum amount of information as to the effect of the various fertilising constituents is obtainable from the smallest number of plots:—

Plot No. 1.	Lime, nitrogen, phosphate, potash.
Plot 2.	Lime, nitrogen, phosphate.
Plot 3.	Lime, nitrogen, potash.
Plot 4.	Lime, phosphate, potash.

Plot No. 5. Nitrogen, phosphate, potash.

Two plots to remain unmanured as controls, but to receive the same amount of cultivation as the others. The amount of each constituent to be the same in each mixture.

If all four constituents are needed by the soil one plot, No. 1, will shew an increased yield over the others; if three, it will be apparent in two plots; if two, three plots will demonstrate the fact; whilst if one only four plots will shew an increase over the fifth and over the controls.

For instance, supposing lime, potash, and phosphate are required, Nos. 1 and 4 will give greater increases in yield than the remainder; if lime and potash are wanted, phosphate being present in sufficient quantity, the fact will be evident from the yields of plots 1, 2, 3 and 4; whilst if potash alone is required plot 2 and the controls would shew smaller increases than the remaining four.

By studying the results so obtained the influence of each individual fertilizer upon the latex flow can be estimated. The rubber and scrap from each plot must be daily carefully labelled and its dry weight recorded. Each week's output of scrap may be weighed in bulk but as a check on the tapping coolies it is better to weigh separately the daily sheets of latex rubber and to compare the yields. A considerable drop in one unaccompanied by a similar fall in the others of the same day would indicate an accident, or some carelessness.

As the experiment proceeds it will be seen from the weekly and monthly totals the course the results are taking, and if, as advocated below, the application of the manures is made just before the onset of the wintering season, a marked effect may be very quickly apparent.

In any case before the end of the year the order and degree of the efficacy of each of the ingredients of the mixtures will be definitely indicated. A second set of experiments should then be initiated, on plots previously selected and whose yields have been recorded, in which the fertilisers shewn to have only a slight effect or none at all are excluded; of the others one combination only should be selected, this also based on the degree of potency disclosed, and applied on a value basis of \$5, \$10, and \$20. per acre, extending to higher amounts if thought desirable, to different plots. The former trials having shewn the manure required, this second series will demonstrate the amount in which it can be most profitably used. For estimating the effect on bark renewal it may be thought advisable to continue the original experiments, renewing the fertilisers every other year, until definite results, positive or negative, are obtained; but probably the plant foods found best to stimulate

latex flow will also prove to be those most beneficially affecting the general health of the tree and its bark renewing capacity.

In the original experiments the lime should be applied in a quantity of $\frac{1}{4}$ to $\frac{1}{2}$ ton per acre according to the nature of the soil.* The proportions of the other ingredients would best be defined by the chemist as a result of his examination of the soil; but in the absence of any marked deficiency or abundance of any one a ratio of nitrogen: potash: phosphate:: 1: 2: 2 may be suggested.

The cost of the complete manure excluding lime should however not exceed \$20.00 per acre; the total cost, including liming and application, should be then not much more than \$30 per acre in the case of the most expensive mixture, and would be more than recouped at the present price of 2/6d per lb. by an increased yield of 40 lbs. of rubber.†

The above suggestions are intended to apply to normal soils, on which ammonium sulphate, concentrated superphosphate, and potassium sulphate may be employed as the sources of nitrogen, phosphate, and potash respectively.

In special cases additional experiments with other fertilisers would be recommended. For instance a peaty soil would be expected to benefit by heavier liming and the application of potash manures; a clay by basic slag, perhaps to the exclusion of potash; whilst on sandy soils organic sources of nitrogen such as oilcake might reasonably be expected to prove of greater service than sulphate of ammonia.

As regards the time at which the fertilisers should be applied there is no doubt that it should be about a month before the commencement of wintering, the season of physiological drought, it being in the prevention of the fall in yield experienced in most places at that time that the effect of the manures is most obvious.

The following figures are taken from the results obtained at Kuala Lumpur during the wintering season 1913 and shew the effect of the drought or wintering upon the yield and the influence of fertilisers in counteracting it. The complete results are, as mentioned above, not ready for publication at the time of writing:—

	Ounces of dry rubber			%age decrease	No. of lb decrease
	Jan-March	April	June		
Control	3949	2820	28%	70	
Lime	3585	2687	25.3	56	
Nitrogen, phosphate	3953	3191	19.2	48	
Nitrogen, potash, lime	2933	2468	15.8	29	
Potash, phosphate, lime	3582	3264	8.8	20	
Potash, phosphate, lime, nitrogen	3476	3271	5.9	13.	

* Written January, 1914.

† The Reasons for revising these amounts have been obtained. They will be discussed in the forthcoming *Bulletin*.

Each plot of 90 trees, approximately 1 acre.
Trees 12—14 years old.

With the exception of lime, which was put down earlier, the manures were applied in the middle of February, and wintering took place during March and April. It is seen that the greatest decrease was that of the unmanured control; lime and nitrogen both had some influence in preventing the drop; potash and phosphate separately brought about a considerable effect, whilst in the two cases in which both were applied together the reduction in yield was comparatively very small, and, had the fertilisers been applied earlier, would possibly have been even less.

It does not follow of course that similar trials would take the same course on all classes of soil, the effect of wintering varying greatly in different places; but it seems certain that there must be many estates on which the cost of suitable manuring would be more than recovered during the dry season alone.

The writer hopes that he has made out a case for experimentation. No other agricultural industry has retained its highest state of development without the use of fertilisers and it is hardly likely that rubber will be an exception. Little expenditure is called for save that of trouble, and the information gained will be of great value, perhaps in the present, certainly in the future. Where the chemist can only indicate probability, as regards the plant nutrients required by a particular soil, the result of the practical trial will define with certainty, and, of greater economic importance, will demonstrate the course it will be most profitable to pursue, at which otherwise little more than a guess can be hazarded.

NOTE ON THE QUALITY OF SODIUM BISULPHITE.

BY B. J. EATON.

Several samples of sodium bisulphite have been examined recently on account of complaints with regard to quality, colour etc, and the results show the necessity of some guarantee of strength or quality when purchasing commercial grades.

If a grade is sold at a particularly cheap price by a firm, it may be more economical to purchase a higher grade material at a higher rate, since in this country, the highest grade material, in this case, is probably the most economical, as with low grade quantities, freight has to be paid on the main constituent—sodium bisulphite—and on the impurities, which, although perhaps harmless in their action on the rubber, are useless for the object desired viz: the production of a pale coloured rubber.

The following are the results obtained on analysis of a few samples:—

		Sodium bisulphite per cent.
Sample	I. (from a factory superintendent).	12.0
"	II. (" an estate manager) ..	77.3
"	III. (" a commercial firm) ..	99.5
"	IV. (Extra pure dry U. S. P. VIII Laboratory sample) ..	100.0
"	V. Commercial Powder (Lab: Sample)	48.3
"	VI. Solution of No. III kept for about 3 weeks	85.3

Samples Nos. I,* II, and III were of a cream colour and gave a yellow solution in water, but this did not affect the ultimate pale colour of the rubber.

Sample V was a sample from the laboratory purchased from a chemical firm in England a year or two ago. This sample may have become oxidised, but this does not seem very probable as the bottle containing it was nearly full and was well stoppered. This chemical however is likely to deteriorate rapidly in a tropical climate if exposed for any considerable time, so that it should always be kept in closed vessels and in the coolest place possible. If large drums are purchased, the contents of which are not used up for several months, it would probably be advisable to fill several smaller vessels to avoid too frequent exposure of the salt. The deterioration of sample III in solution, on keeping, is evident.

It is proposed to investigate the deterioration on keeping under different conditions.

Samples will be examined if forwarded to the Director of Agriculture. Such samples should be sent in well closed bottles which should be full.

SPECIES OF LORANTHUS ON RUBBER TREES.

BY F. T. BROOKS.

The February number of the *Agricultural Bulletin* contained a short account of the occurrence of two semi-parasitic flowering plants on *Hevea brasiliensis*. These plants belong to the genus *Loranthus* all the species of which are semi-parasites on other flowering plants and similar in their mode of life to *Viscum album*, the common mistletoe of Europe. Reports have since been obtained of the presence of these parasites on a small scale in a few other estates in Negri Sembilan and the occurrence of a species of *Loranthus* on rubber trees in Pahang was recorded by Bateson in the *Agricultural Bulletin of the S. S. and F. M. S.* in 1911.

*(Note:—Sample I had been lying in an envelope for some time and was therefore exposed to the atmosphere.)

Certain persons have pointed out that these semi-parasites do not apparently cause much harm to rubber trees. This is because these troublesome plants have rarely been numerous in estates yet, but a few trees which I have seen heavily laden with them had evidently suffered severely. In England a single mistletoe on an apple tree does little harm but if mistletoes are allowed to develop with impunity the trees are greatly weakened and the crop becomes negligible in consequence. In the same way any considerable development of parasitic flowering plants on rubber trees would cause general weakening of the trees and a lessened output of latex. Hence it is unwise to allow these parasitic growths to develop on rubber trees and all branches bearing them should be cut out as soon as discovered. Care should be taken to cut back the branches well beyond the point to which the external creeping stems of these parasites extend. In the species of *Loranthus* under consideration these creeping stems give off suckers every here and there which form the means of attachment to the host and the channels by which certain food substances are obtained. The suckers are of two kinds—those which penetrate the tissues of the host to the wood and those which do not pass beyond the bark, many of the latter in fact being merely adhesive discs loosely attached to the exterior. Suckers which penetrate the wood often become much swollen and the stems of the host in the immediate vicinity are also abnormally developed, the whole producing a large knob of hypertrophied tissue. These parasites travel along the host by means of stems which creep over the exterior.

Many kinds of *Loranthus* are very common in the tropics and any one species usually grows upon several different kinds of hosts. One species of *Loranthus* found on rubber trees has also been seen on the *Melastoma* which is one of the commonest shrubs of the roadside and of waste places in this country.

These semi-parasites are disseminated by means of birds which deposit the seeds on the branches of trees and shrubs. As stated in the February number of the *Agricultural Bulletin* these troublesome plants are much more likely to develop on trees which are in poor condition or which throw little shade than on those which have a dense leaf canopy.

In this connection it may be mentioned that harmless epiphytic plants on coconut and rubber trees are sometimes mistaken for dangerous parasites. Quite recently a number of coconut palms were thought to be seriously affected by the common epiphytic fern *Drymoglossum* which was growing in considerable abundance on the stems. This fern, however, is harmless for, like other epi-

phytes, it does not penetrate the interior and so does not withdraw nourishment from the plant to which it is attached. Trees are not adversely affected by the many different kinds of epiphytic ferns and flowering plants which often grow upon them in tropical countries; on the other hand parasitic flowering plants like *Loranthus* which penetrate the interior of the plants to which they are attached cause considerable damage to their hosts.

FRUITING OF PASSIFLORA EDULIS.

BY J. N. MILSUM.

As this is the first occasion on record of *Passiflora edulis*, commonly known as the Passion-fruit or Sweet Cup, fruiting in the Federated Malay States Experimental Plantations, a few notes on the subject may be of some interest.

Several plants are now bearing fruit at the Gunong Angsi Plantation, at an elevation of 1500 feet. These are trained over a trellis-work, at about 4 feet from the ground, in the full sun, though the flowers and fruit are shaded by the dense growth of foliage. It is, however, generally considered that a moist shaded situation suits them best. The plants have been growing in their present positions for nearly three years but up to the present had not even shown flowers. A native of Brazil, the Passion-fruit appears to have been cultivated in the East for some considerable time. In Australia, the fruit finds much favour, from whence consignments have been sent to London where occasionally very good prices have been obtained for them.

P. edulis is a quick growing, perennial climber. The fruit which is about the size of a hen's egg is green in colour becoming purple when fully ripe. The interior of the fruit is edible and is composed of a quantity of fragrant, sweet pulp which contains the seeds. This pulp is very palatable and may be either eaten from the shell or beaten up in a glass to form a delicious drink.

In Ceylon two crops are obtained during the year. Propagation is affected by seeds though probably cuttings would root readily under favourable conditions. It is doubtful however if a crop of fruit would be produced on low land. In Ceylon to cultivate the Passion-fruit successfully, it requires to be grown at an elevation of 2000 feet or upwards.

MANURIAL EXPERIMENTS WITH YOUNG RUBBER AT KUALA LUMPUR.

THIRD YEAR'S RESULT.

BY F. G. SPRING.

A description of these experiments was published in the *Agricultural Bulletin*, F. M. S. Vol. II, p. 88, and the results for the first and second year were there given.

In reviewing the results for the three years it is noticeable that during the first year, the trees in the manured plots, in every case, showed a good excess in girth measurements over the trees in the unmanured plots. In the second year, there was no manure applied, and reference to the tables will show that the average girth increases, for this period, are about equal to that of the control plots which goes to prove that the manures had good effect for one year only. At the commencement of the third year, a second application of similar manures was applied, and the results for this year show that in one block of land (Table A), the trees in the manured plots, have, in each case, an excess in girth measurement over trees of the unmanured plot but not as large an excess as was evident the first year. The trees at the time of the first application were small, consequently the manures were forked lightly in around the trees to a depth of two to three inches, between two circles of 1 and 4 feet radius, the tree being the centre of the circle, while at the time of the second application the trees were two years older in view of which the fertilizers were broadcast all over the soil and lightly forked under. As the quantities of manures in both applications were equal it would be expected that better results would be obtained with the first application as the manures were more concentrated in the root feeding area.

In the other block of land (Table B) there is no appreciable difference, in the third year, between the average girth increases of the manured plots and the control. In the first article dealing with this experiment (*Agr. Bulletin* Vol. I, p. 194) it is pointed out that Plot A is fairly flat, while Plot B is undulating, a disadvantage in experiments of this nature as there is a tendency for manures to be washed from one plot to another.

The total excess girth increases over the unmanured plots for the three years are as follows:—Table A: 3·81, 2·53, 3·87, 1·81, and 3·21 inches. Table B: 1·56, 1·97, 0·77, 1·38, 2·42, and 1·33 inches. From the point of view of girth increase these results cannot be called very satisfactory when one considers the cost of two applications of manures. On the other hand, the branch, leaf development, and general appearance of the trees would appear to be better than that of the control plots, and it is probable that the beneficial effects derived will be more evident as regards yields of rubber; this will be reported on after tapping has been conducted for some time.

The increase in girth over trees of the unmanured plots for the first year is as follows:—

TABLE A.

Plot.	Fertilizer added	Increase in girth over trees of the unmanured plots.
2.	Lime, Nitrogen	1.36 inches.
4.	Lime, Nitrogen, Potash	1.23 „
1.	Lime, Nitrogen, Phosphate	1.87 „
5.	Lime, Potash, Phosphate	1.87 „
3.	Lime, Potash, Phosphate, Nitrogen	2.35 „

TABLE B.

9.	Lime	1.05 „
7.	Lime, Potash	1.12 „
8.	Lime, Phosphate	1.87 „
12.	Phosphate, Potash, Nitrogen	1.48 „

The increase for the second year is as follows:—

TABLE A.

Plot.	Fertilizer added	Increase in girth over trees of the unmanured plots.
2.	Lime, Nitrogen	0.19 inches.
4.	Lime, Nitrogen, Potash	0.04 „
1.	Lime, Nitrogen, Phosphate	0.28 „
5.	Lime, Potash, Phosphate	0.51 „
3.	Lime, Potash, Phosphate, Nitrogen	-0.01 „

TABLE B.

9.	Lime	-0.58 „
7.	Lime, Potash	0.24 „
8.	Lime, Phosphate	0.26 „
12.	Phosphate, Potash, Nitrogen	0.15 „

The increase for the third year is as follows:—

TABLE A.

Plot.	Fertilizer added	Increase in girth over trees of the unmanured plots.
2.	Lime, Nitrogen	0.98 inches.
4.	Lime, Nitrogen, Potash	0.54 „
1.	Lime, Nitrogen, Phosphate	1.66 „
5.	Lime, Potash, Phosphate	0.83 „
3.	Lime, Potash, Phosphate, Nitrogen	1.53 „

TABLE B.

9.	Lime	0.30 „
7.	Lime, Potash	0.20 „
8.	Lime, Potash	- 0.16 „
12.	Phosphate, Potash, Nitrogen	- 0.30 „

The following table shews the increase, in each plot, over a period of the three years (effect of two applications of manure), also excess over the control plot for the same period.

TABLE A.

Plot.	Fertilizer added	Total increase over a period of 3 years	Excess over control plot
1.	Sulphate of Ammonia, Double Superphosphate, Lime	15.79 ins.	3.81 ins.
2.	Sulphate of Ammonia, Lime	11.51 „	2.53 „
3.	Sulphate of Ammonia, Sulphate of Potash, Double Superphosphate, Lime	15.85 „	3.87 „
4.	Sulphate of Ammonia, Sulphate of Potash, Lime	13.79 „	1.81 „
5.	Double Superphosphate, Sulphate of Potash, Lime	15.19 „	3.21 „
6.	No Manure	11.98 „	

TABLE B.

7.	Sulphate of Potash, Lime	15.24 „	1.56 „
8.	Double Superphosphate, Lime	15.65 „	1.97 „
9.	Lime	14.45 „	0.77 „
10.	Perlis Guano	15.06 „	1.38 „
11.	Bone Meal	16.10 „	2.42 „
12.	Sulphate of Ammonia, Double Superphosphate, Sulphate of Potash	15.01 „	1.33 „
13.	No Manure	13.68 „	

No. of trees in each Plot, 120.

TABLE A.

No. of Plot	Manure applied	Date of applying manure	Date of applying manure	Average girth 1 foot from ground					Increase in girth		
		1st application	2nd application					1st year	2nd year	3rd year	
1	Sulphate of Ammonia...	14 Nov. 1911	30 Dec. 1913	2.35 ins.	7.00 ins.	11.05 ins.	18.14 ins.	4.65 ins.	4.05 ins.	7.09 ins.	
	Double Superphosphate	16 Nov. 1911	31 Dec. 1913	Oct. 1911	Oct. 1912	Oct. 1913	Oct. 1914	...	...	...	
2	Lime ...	21 Sept. 1911	14 Oct. 1913	...	...	...	...	...	...	...	
	Sulphate of Ammonia...	15 Nov. 1911	30 Dec. 1913	1.90 ins.	6.04 ins.	10.00 ins.	16.41 ins.	4.14 ins.	3.96 ins.	6.41 ins.	
3	Lime ...	21 Sept. 1911	14 Oct. 1913	Oct. 1911	Oct. 1912	Oct. 1913	Oct. 1914	...	...	...	
	Sulphate of Ammonia ...	16 Nov. 1911	30 Dec. 1913	2.15 ins.	7.28 ins.	11.04 ins.	18.00 ins.	5.13 ins.	3.76 ins.	6.96 ins.	
4	Double Superphosphate	18 Nov. 1911	31 Dec. 1913	Oct. 1911	Oct. 1912	Oct. 1913	Oct. 1914	...	...	...	
	Sulphate of Potash	28 Nov. 1911	2 Jan. 1914	...	...	...	...	...	...	...	
5	Lime ...	28 Nov. 1911	15 Oct. 1913	...	...	...	...	...	...	...	
	Sulphate of Ammonia...	16 Nov. 1911	30 Dec. 1913	2.12 ins.	6.13 ins.	9.94 ins.	15.91 ins.	4.01 ins.	3.81 ins.	5.97 ins.	
6	Sulphate of Potash	28 Nov. 1911	2 Jan. 1914	Oct. 1911	Oct. 1912	Oct. 1913	Oct. 1914	...	...	...	
	Lime ...	2 Oct. 1911	15 Oct. 1913	...	...	...	...	...	...	...	
7	Double Superphosphate	18 Nov. 1911	31 Dec. 1913	2.01 ins.	6.66 ins.	10.94 ins.	17.2 ins.	4.65 ins.	4.28 ins.	6.26 ins.	
	Sulphate of Potash	29 Nov. 1911	2 Jan. 1914	Oct. 1911	Oct. 1912	Oct. 1913	Oct. 1914	...	...	...	
8	Lime ...	2 Oct. 1911	15 Oct. 1913	...	...	...	...	...	...	...	
	No Manure ...	...	...	2.35 ins.	5.13 ins.	8.90 ins.	14.33 ins.	2.78 ins.	3.77 ins.	5.43 ins.	
9		...	...	Oct. 1911	Oct. 1912	Oct. 1913	Oct. 1914	...	...	...	
		...	...	...	...	...	...	...	...	...	

Rate of application:—Sulphate of Ammonia $\frac{1}{2}$ lb. per tree.
Double Superphosphate $1\frac{1}{2}$ lbs. per tree.

Sulphate of Potash 1 lb. per tree.
Lime 1,000 lbs. per acre.

TABLE B.

No. of trees in each Plot, 120.

No. of Plot	Manure applied	Date of applying manure		Average girth 1 foot from ground				Increase in girth		
		1st application	2nd application					1st year	2nd year	3rd year
7	Sulphate of Potash Lime	29 Nov. 1911	2 Jan. 1914	2.96 ins. Oct. 1913	7.77 ins. Oct. 1911	11.63 ins. Oct. 1912	18.2 ins. Oct. 1914	4.81 ins.	3.86 ins.	6.57 ins.
		6 Oct. 1911	19 Oct. 1913					...	...	...
8	Double Superphosphate Lime	19 Nov. 1911	31 Dec. 1913	2.44 ins. Oct. 1913	8.00 ins. Oct. 1911	11.88 ins. Oct. 1912	18.09 ins. Oct. 1914	5.56 ins.	3.88 ins.	6.21 ins.
		9 Oct. 1911	19 Oct. 1913					...	...	...
9	Lime	13 Oct. 1911	19 Oct. 1913	2.73 ins. Oct. 1913	7.47 ins. Oct. 1911	10.51 ins. Oct. 1912	17.18 ins. Oct. 1914	4.74 ins.	3.04 ins.	6.67 ins.
		...	...					...	...	...
10	Perlis Guano	30 Nov. 1911	3 Jan. 1914	2.72 ins. Oct. 1914	7.65 ins. Oct. 1911	11.21 ins. Oct. 1912	17.78 ins. Oct. 1914	4.93 ins.	3.56 ins.	6.57 ins.
		...	...					...	...	...
11	Bone Meal	30 Nov. 1911	3 Jan. 1914	3.11 ins. Oct. 1914	8.47 ins. Oct. 1911	12.79 ins. Oct. 1912	19.21 ins. Oct. 1914	5.36 ins.	4.32 ins.	6.42 ins.
		...	...					...	...	...
12	Sulphate of Ammonia Double Superphosphate Sulphate of Potash	13 Nov. 1911	30 Dec. 1913	3.02 ins. Oct. 1913	8.19 ins. Oct. 1911	11.96 ins. Oct. 1912	18.03 ins. Oct. 1914	5.17 ins.	3.77 ins.	6.07 ins.
		30 Nov. 1911	31 Dec. 1913					...	...	...
13	No Manure	30 Nov. 1911	2 Jan. 1914	...	...	...	...	...	...	...
		...	...	2.71 ins. Oct. 1914	6.40 ins. Oct. 1911	10.02 ins. Oct. 1912	16.39 ins. Oct. 1914	3.69 ins.	3.62 ins.	6.37 ins.

Rate of application:—Sulphate of Potash 1 lbs. per tree.
 Double Superphosphate $1\frac{1}{2}$ lb. per tree.
 Perlis Guano 4 lbs. per tree.

Bone Meal 3 lbs. per tree.
 Sulphate of Ammonia $\frac{1}{2}$ lb. per tree.
 Lime 1,000 lbs. per acre.

DISC HARROWS.

BY F. G. SPRING.

Some notes on the efficiency of disc harrows have recently been received from a planter in Malaya, and may be of interest to those who adopt this method of cultivation.

"After a good deal of experience with the disc harrow I was not at all satisfied with its efficiency until I tried the experiment of removing each alternate disc; converting the ordinary 12-disc harrows into wide-spaced 6-disc harrows. The result was most satisfactory, and a very good tilth can be obtained, with the advantage of a well marked furrow. In the final harrowing of a field, the furrows are left transversely to the slope of the ground, and surface wash is reduced to a minimum. The top soil in which the harrows are cultivating is of a sandy clay and in places a sandy loam. It is all old tapioca land reclaimed from lalang. The soil cakes very hard on top fairly rapidly if left uncultivated."

The above results would possibly not be obtained to the same degree on light and heavy types of soils. The formation of a well marked furrow is important as more prominent ridges are capable of withstanding, to a larger extent, the beating down effects of rain, and thus reduce, if the furrows are transversely to the slopes of the ground, the damage done by surface wash. Small ridges on light soils, could not withstand, for any length of time, heavy rains.

It is obvious that the remarks refer to undulating land, and for such, the method seems a good one. It should not be taken, however, that the same would necessarily apply to flat ground. The nature of the sub-soil would also require to be taken into account.

PRELIMINARY LIST OF INSECTS COLLECTED IN THE FEDERATED MALAY STATES.

BY C. B. HOLMAN HUNT.

(Continued.)

The uncommon species are marked with an asterisk.

EUPODA. (Sub-family.?)

<i>Crioceris quadripustulata</i> . Fab.	Bukit Kutu, Selangor.	3300 feet.
<i>Crioceris impressa</i> . Fab.	Batu Tiga, Selangor.	Plains.
* <i>Lema rothschildi</i> (= <i>nigrilabris</i>) Claver.	Parit Buntar, Perak.	Plains.

HALTICIDES.

<i>Graptodera caerulea</i> . Oliv.	Kuala Lumpur, Selangor.	Plains.
* <i>Graptodera</i> nr. <i>caerulea</i> . Oliv.	Kuala Lumpur, Selangor.	Plains.
* <i>Haltica birmanensis</i> . Jacoby.		Plains.
* <i>Haltica cyanea</i> . Weber	Caledonia Estate Prov : Wellesley.	Plains.
* <i>Chaloenas</i> sp.	Batu Tiga, Selangor.	Plains.
* <i>Sphaenoderma</i> nr. <i>rafflesi</i> . Jacoby.		Plains.

EUMOLPIDES.

<i>Colaspoides simillima</i> . Baly.		Plains.
* <i>Cleorina cylindrica</i> . ? Baly.	Gap, Selangor-Pahang.	2700 feet.

CAMPTOSOMES. (Sub-family.?)

* <i>Aspidolopha lata</i> . Clk.		Plains.
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GALERUCIDES.

<i>Ozomena elegantula</i> . Baly.	Batu Caves, Selangor.	Plains.
* <i>Carithea sumatrensis</i> . Jacoby.	Batu Caves, Selangor.	Plains.
<i>Haplosomy</i> * <i>albicornis</i> . Wiede.	Maxwell's Hills, Perak.	3400 feet.
<i>Haplosomy</i> * <i>sumatrae</i> , var. <i>unicolor</i> . Illig.	Batu Caves, Selangor.	Plains.
<i>Olides pectoralis</i> . Clark.	Bukit Kutu, Selangor.	3300 feet.
* <i>Aulocophora</i> sp. unnamed.	Batu Caves, Selangor.	Plains.
<i>Aulocophora luteicornis</i> . Fabr.		Plains.
<i>Hoplasoma ventralis</i> . Baly.		Plains.
* <i>Aenidea jacobyi</i> . Baly.	Batu Caves, Selangor.	Plains.
<i>Metrioidea apicalis</i> . Jac.		Plains.
* <i>Monolepta</i> sp. unnamed.	Caledonia Estate, Prov. Wellesley.	Plains.
* <i>Hyphoemia balyi</i> . Jacoby.		Plains.
<i>Galerucella rugosa</i> . Jacoby	Parit Buntar, Perak.	Plains.
<i>Sermylodes basalis</i> ? Jacoby.		Plains.
* <i>Mimastra annandalei</i> . Jacoby.	Maxwell's Hills, Perak.	3400 feet.
* <i>Xenoda nigricollis</i> .	Kuala Lumpur, Selangor.	Plains.

HISPIDES.

<i>Anisodera scutellata</i> . Baly.	Batu Tiga, Selangor.	Plains.
* <i>Anisodera rufa</i> . Grier.	Bukit Kutu, Selangor.	3300 feet.
<i>Gonophora haemorrhoidalis</i> . Fab.		Plains.
* <i>Gonophora</i> nr. <i>pallida</i> . Baly.		Plains.
* <i>Gonophora</i> nr. above.	Batu Tiga, Selangor.	Plains.
* <i>Hispa</i> sp. (1)	Parit Buntar, Perak.	Plains.
* <i>Hispa</i> sp. (2)	Caledonia Estate, Prov. Wellesley.	Plains.

CASSIDIDES.

<i>Aspidomorpha miliaris</i> . Fab.	Batu Caves, Selangor.	Plains.
<i>Aspidomorpha elevata</i> . Fab.		Plains.
<i>Aspidomorpha assimilis</i> . Bohem.		Plains.
<i>Laecoptera</i> 13-punctata. Fab.	Parit Buntar, Perak.	Plains.

PRIONIDES.

<i>Sarmydus antennatus</i> . Pasc.	Ulu Gombak, Selangor.	Plains.
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CERAMBYCIDES.

<i>Hammaticherus fuliginosus</i>	Oliv.	Ulu Gombak, Selangor.	Plains.
* <i>Xoanoderainscita</i>	Pasc.	Ulu Gombak, Selangor.	Plains.
<i>Aeolesthes aurifaber</i>	White.	Klang, Selangor.	Plains.
<i>Dialeges pauper</i>	Pasc.	Ulu Gombak, Selangor.	Plains.
<i>Xystrocera globosa</i>	Oliv.	Ulu Gombak, Selangor.	Plains.
<i>Xystrocera festiva</i>	Thoms.	Bukit Kutu, Selangor.	3300 feet.
<i>Stromatium asperulum</i>	White.	Buhit Kutu, Selangor.	3300 feet.
<i>Chloridolum thompsoni</i>	Thoms.	Gap, Selangor-Pahang.	2700 feet.
<i>Chloridolum cinnyris</i>	Pasc.	Batu Tiga, Selangor.	Plains.
<i>Gnatholea eburifera</i>	Thoms.	Batu Tiga, Selangor.	Plains.
<i>Noserius tibialis</i>	Pasc.	Gap, Selangor-Pahang.	2700 feet.
<i>Chlorophorus annularis</i>	Fab.	Batu Tiga, Selangor.	Plains.

LAMIIDES.

<i>Xylorrhiza adusta</i>	Wiedem.	Riverside Estate, Kuala Selangor.	Plains.
<i>Xylorrhiza adusta</i>	Wiedem. dark van.	Riverside Estate, Kuala Selangor.	Plains.
<i>Batocera thompsoni</i>	de Geer.	Riverside Estate, Kuala Selangor.	Plains.
<i>Batocera lowei</i>	White.	Kuala Lumpur, Selangor.	Plains.
<i>Batocera albofasciata</i>	de Geer.	Kuala Lumpur, Selangor.	Plains.
<i>Epipotes luscus</i>	Fab.	Kuala Lumpur, Selangor.	Plains.
<i>Coptops polyspila</i>	Pascoe.	Ulu Gombak, Selangor.	Plains.
* <i>Glenea nr. scripta</i>		Gap, Selangor-Pahang.	2700 feet.
<i>Glenea propinqua</i>	Gahan.		Plains.
* <i>Glenea robinsoni</i>	Gahan.	Maxwell's Hills, Perak,	3400 feet.
* <i>Glenea</i> between {	<i>obsoletopunctata</i> Thoms.	K. Lumpur, Selangor.	Plains.
	& <i>distinguenda</i> Gahan.		
<i>Anancylus griseatus</i>	Pascoe.	Kuala Lumpur, Selangor.	Plains.
<i>Cleptometopus nr. humeralis</i>	Gahan.	Maxwell's Hills, Perak.	3400 feet.
<i>Astathes terminata</i>	Pascoe		Plains.
<i>Gnoma subfasciata</i>	Thoms.		Plains.
<i>Olenecamptus bilobus</i>	Fab.	Batu Tiga, Selangor.	Plains.
<i>Peribasis helenor</i>	Newm.	Bukit Kutu, Selangor.	3300 feet.
* <i>Pterolophia ligata</i>	Pasc.	Batu Tiga, Selangor.	Plains.
<i>Pterolophia subtineta</i>	Pasc.	Gap, Selangor-Pahang.	2700 feet.
<i>Pterolophia melanura</i>	Pasc.	Batu Tiga, Selangor.	Plains.
<i>Cacia picticornis</i>	Pasc.	Batu Tiga, Selangor.	Plains.
<i>Cylindrepornus laeta</i>	Pasc.		Plains.
* <i>Cyrdium</i> sp.		Gap, Selangor-Pahang.	2700 feet.
* <i>Hylobrotus ploemi</i>	Lacord.	Gap, Selangor-Pahang.	2700 feet.

In last month's bulletin on page 337 the Specific name of the first beetle on the list should be "Occipitalis" not "Occipitalls" and on page 338 the name of the last family should be "BYRRHIDAE" not "BYRHIDAE."

(To be continued.)

MINUTES OF MEETING OF THE PLANTERS' ASSOCIATION OF MALAYA,

*Held at the Chamber of Commerce, Kuala Lumpur, on
August 23rd, 1914, at 10.45 a.m.*

PRESENT:

The Hon. Mr. E. Macfadyen (in the Chair)

Mr. H. C. E. Zacharias, (Secretary).

Delegates:—

Bagan Datoh P. A.:—Messrs. E. Enfield Lawford and A. H. Fraser.

Batang Padang P. A.:—Messrs. T. H. Stewart and W. H. Tylden-Patterson.

Batu Tiga D. P. A.:—Messrs. T. J. Cumming and H. L. Jarvis.

Johore P. A.:—Mr. W. N. Gawler.

Kajang D. P. A.:—Messrs. D. F. Wise, C. Burn-Murdoch
Eustace M. Schwabe and K. G. Furley.

Kapar D. P. A.:—Messrs. J. G. Cruickshank, L. Mooijaart and
E. W. Harvey.

Klang D. P. A.:—Messrs. E. B. Prior and E. C. Wakefield.

Kuala Lumpur D. P. A.:—The Hon. Mr. E. B. Skinner and
Messrs. H. Armstrong, F. Clyde
Jeavons and A. J. Fox.

Kuala Selangor D. P. A.:—Messrs. R. H. Ransom, Thomas
More, G. Rutherford and L. A.
Irving.

Malacca P. A.:—Messrs. J. W. Campbell and E. A. Barbour.

Negri Sembilan P. A.:—Messrs. V. A. Tayler, S. S. Crisp,
J. D. McCulloch P. W. N. Far-
quharson, C. Ritchie, A. Dupuis-
Brown and F. J. Lloyd.

Ulu Selangor D. P. A.:—Messrs. F. W. Davies and M. D.
Fallon.

*Honorary Members:—*Mr. E. S. Hose (Ag. Controller of Labour,
Mr. L. Lewton-Brain (Director of
Agriculture) and Dr. C. L. San-
som (P. M. O.).

*Visitors:—*Kuala Lumpur District:—Messrs. B. J. Eaton, H. P.
Clodd, L. Edwards, O. D. Mathe-
son, W. Leggatt, C. Kinder, F. G.
Harvey, J. A. Brown, C. J.
Arnold, J. A. Baird, M. Sharpe-
Smith, V. U. Kelso, E. W. King,

Kuala Lumpur District:— D. Gardner, G. F. Richardson, A. Keightley Smith and R. J. Rogers.

Ulu Selangor District:—Messrs. M. J. Kennaway, N. H. Dakeyne and G. C. Bailey.

Klang District:—Messrs. A. A. Mulloy, H. R. Quartley, C. Hammond-Smith and J. G. Cruickshank.

Batu Tiga District:—Messrs. W. H. Bragg & D. Lumsden.

Kajang District:—Messrs. R. C. M. Kindersley, K. G. Furley, S. S. Stevens, E. G. Leyne and O. P. Dakeyne.

Kuala Selangor District:—Mr. R. W. G. Mercer.

Kapar District:—Messrs. E. A. Ash, C. Henly and S. Winthrop.

1. The Minutes of the Meeting held on June 28th 1914, having been circulated, are taken as read, confirmed and signed.

2. THE WAR.

The Hon. Mr. *E. Macfadyen* says members had before them the printed Minutes of an Emergency Meeting which had been convened on the outbreak of the war. He would remind them of the position at the time: the Stock Exchange, instead of opening after the August Bank Holidays, had proclaimed three further holidays. Everything throughout the whole commercial world was at an absolute standstill and the telegraphic censorship had completely stopped all telegraphic remittances. These were the conditions in which they suddenly found themselves within two days of the legal payday of their coolies. The emergency meeting had consequently been called, to arrive at some concerted action and to avert what looked like a catastrophe. The Minutes before them were a record of what had taken place at that meeting and he would now formally move that they be adopted.

As they were aware, the gist of the agreement arrived at was to make only food and small cash advances, to meet the emergency. It was clear that the steps taken could not in all points meet the individual needs of every district, but the main lines of the arrangement made had with unanimous loyalty been adopted by all Constituent Associations and the object aimed at, viz. of conserving as much as possible the local cash reserves at the disposal of the estates, had been completely achieved. He would add that the Government had also followed their lead by promising to pay their coolies the July wages in two fortnightly instalments.

He would now table the various circulars which the Secretary had been instructed to issue and also a circular which defined the financial assistance which had been promised by the F. M. S. Government.

As regards the latter, the impression had apparently obtained a hold in London, that the Government of the F. M. S. were able and prepared to carry the rubber industry as they had shown themselves able and ready to carry the tin industry. It was obvious that if Directors and Secretaries at home believed that unlimited funds were obtainable for rubber estates at the Government expense, the very modest scheme of relief which was the most the F. M. S. Government had been able to approve on behalf of planters would do a great deal more harm than good. They therefore on the 17th inst. had wired to the R. G. A.:—"Advise every one not rely financial help local Government. Conditions so onerous money practically unavailable strictly limited anyhow." A second wire had been despatched on the 31st inst., enquiring "When will Rubber Auctions be resumed?" and the reply to this had come through the same day "Twentyfifth August." They since learned from the papers that the auctions would be resumed on Tuesday, when 500 or 600 tons would be put up, and that payment was expected from buyers on Sept. 3rd. That meant that normal conditions had been reverted to to the extent that by Tuesday next people would be selling rubber by auction in London, and the assumption was that those who had organized the auctions were assured that buyers would be able to pay in cash within a week of that date.

The situation now was that through the sympathetic relations subsisting between planters and their labour, and through the organisation of planters as a body, it had been possible during the past few weeks of crisis to carry on the rubber industry with their own resources, and without paying out more than about 30 per cent of their cash liabilities. (Applause.) The rubber industry employed 227,000 coolies in the country, the tin industry employed some 200,000. To maintain the tin industry enormous sums of Government money had had to be employed. To maintain the rubber industry for the time being it had been possible to get on with only that limited Government assistance which had been afforded in a few cases where estates had actually not been in a position to feed their coolies. (Applause.) He thought that was an achievement on which the planting community could congratulate itself.

But the position which had been brought about was one full of dangers. It must be realized that though they had only paid out 30 per cent of their cash liabilities they were still liable for the other 70 per cent. It must be realized that when people were paying out only three-tenths of their liabilities it was not probable that things were being run as economically as they might be, and that so long as that was continued economies which this was a

golden opportunity for introducing might be deferred. (Applause.) Moreover it must be realised that this 70 per cent of monthly liabilities was accumulating, and would have to be discharged one day, and they were only deferring the day of reckoning.

Then when they came to settle their liabilities the coolies would be entitled to receive at one moment a very large cash sum, a sum such as they were not accustomed to handle, and there was a serious risk that a large number of them might at once want to return to their country, at a time when perforce immigration had been stopped. All these matters would have to be considered. He wished also to make it plain that hitherto they had not been advised by Government that the support so far accorded was to be withdrawn, but at the same time they could not expect Government to continue indefinitely to sanction a state of things which in the first instance they only approved for a fortnight. The Association could not, of course, adopt any resolution which was absolutely binding on its members, and they could not agree now that they would pay or would not pay wages on a particular date. What they could, and he certainly thought, ought to do was to decide at what date they would relieve their members from their previous honourable undertaking not to pay their coolies in full.

Before, however, they discussed this, the Minutes of the Emergency Meeting had better be adopted.

The Hon. Mr. *E. B. Skinner* seconds the Chairman's proposal to that effect and this is carried unanimously.

Mr. *Farquharson* asks how they stood with regard to coolies working on contract. In Negri Sembilan when the crisis first arose they had been asked to continue to employ every coolie possible, and members of the Negri Sembilan P. A. had loyally done so, employing in many cases coolies who were unnecessary, but that state of things could not be prolonged indefinitely. Lots of places could not carry on in those circumstances, and he thought Government ought to be warned that when the ordinary coolies were paid large gangs of contract coolies would be thrown out of work.

Mr. *Edwards* would like to suggest that they fix no date for altering the present arrangement until they were assured that the rubber auctions would follow a normal course. All they know at present was that an auction had been fixed. It remained to be seen whether buyers would come forward in sufficient numbers to absorb the quantity of rubber offered. Speaking for his own companies he might say that funds were extremely limited. Before this crisis arose they were in a position to draw on London for practically all the money they required, whereas they now received telegraphic remittances for moderate amounts, with strict instruc-

tions to make the money go as far as possible, only paying for what was absolutely necessary. In some cases they had been asked to suggest to their managers that they should be content to draw only a small proportion of their salaries. As the present arrangement had worked without any disturbance at all, he thought they should go on until they felt the monetary stringency had been relieved. He knew for a fact that banks at the present time were very disinclined to negotiate bills of exchange either under a letter of guarantee or against documents.

Mr. *Bourbour* could not agree that under the present arrangement there had been no dissatisfaction amongst the coolies. Their experience in Malacca, where the Chinese coolies had in most cases only been given their food, was that they were actually asking for a promise of payment on a definite date. They were quite prepared to go on working if they got that. It had been suggested that their July wages should be paid next Saturday, and it was left to the discretion of the Managers to promise when the balance should be paid. The arrangement for all he knew, might continue to work indefinitely among Tamils, but with Chinese it would not; they would have a good deal of trouble. With regard to banks he thought the last speaker had exaggerated the position.

Mr. *F. G. Harvey* suggests to divide the discussion under two headings—Chinese and Tamil labour.

The Hon. Mr. *E. B. Skinner* points out that that amounted to class legislation—or rather racial legislation—and he should doubt very much whether they could expect the support of Government in it. Tamils themselves would naturally want to know why the Chinese were being preferred to themselves (Applause).

He begged to move that the Association express itself in favour of paying the balance due on the July wages on August 31st; one half of August wages on the second or third Saturday of September, and the balance a fortnight later, the normal course to be resumed by the payment of September wages in full at the usual time. His reason for recommending a return to normal conditions was largely in support of what the Chairman had said as to economies. While the present arrangement continued they could take no steps to reduce wages or labour forces, while if they went on much longer the cost of production would shew a distinct increase instead of a decrease. That was what they wanted to avoid at all costs.

Producing Companies at Home were notoriously accumulating reserves. Again, there was a large number of Companies, which had not yet reached that stage, and were being run on Capital account. Surely most of these companies had unused capital to fall back upon. It therefore practically boiled itself down to the fact

that the great majority of companies had ample resources to meet all their obligations. There was of course a minority, who depended entirely on the revenue derived from sales made. Those estates would naturally have to receive special consideration and for that reason Government had placed a sum of \$400,000 at the disposal of planters.

Mr. *Jarvis* points out that they were only a fortnight behind-hand at present, so why not continue with a fortnight in hand.

The Hon. Mr. *Macfadyen* seconds the principle of Mr. Skinner's notion. He quite agreed with Mr. Farquharson, that, as long as things were on the present basis, people would continue to employ more labour than they actually needed, and that suggested a reply to a good deal Mr. Edwards had said. He was doubtful whether Mr. Edwards quite realised how this was operating on Estates. The Manager could not economise at present because as long as he was in debt to his labour force he could not reduce it. Carrying on from month to month in arrears meant that you must keep your full labour on all the time; that you could not cut down wages, that you could not even revise a man's contract. When these measures were adopted 95 per cent. of employers were not in a position to pay full wages. He supposed at the present moment about 35 to 40 per cent. were not able to pay July wages. But if they had a resolution to pay July wages a week or a fortnight hence it would very much strengthen their hands in getting money. He would suggest that instead of the last day of August they said September 5th for paying July wages, as that would give them time to communicate with London. To keep on as at present was doing no kindness to estates which a fortnight hence were not likely to be in a position to pay. If they were in that position the sooner they realised it the better for them. The people who through this miserable crisis were going to be let down—a very very small proportion of the employers in the country—had much better realise it and not pile up big obligations to their labour forces which they would never be able to discharge.

He imagined that quite 90% of those present could pay now, on the spot,—he would not say all estate liabilities or even August wages—but anyhow the balance of July wages still due.

Nobody believed more than he did in combination, but could they hold up all payments of cash wages throughout the whole country for the sake of four or five per cent. of employers? If it had been for the sake of a large proportion, yes. But as Mr. Skinner had pointed out, the case of those employers who could not meet the simple obligation to pay July wages on September 5th was provided for to the extent that they could get 30 cents per pound against their rubber and in addition to that they could get further sums against their titles.

He would therefore move that this meeting strongly recommend estates to pay July wages on September 5th, and that as far as they could at present see they expected they would be in a position to pay August wages on September 26th, the normal dates and modes of payment being reverted to thereafter. That would give them a free hand to pay off coolies, reorganize work and reorganize wages.

Mr. *Cruickshank* presumes that the rice advances made in August would be deducted from the August, and not from the July wages.

Mr. *Tylden-Patterson* does not understand how estates, depending on the sale of their crop in London, could fix a date for the payment of their July wages.

Mr. *Taylor* concurs that it would be wiser to await the result of the London Auctions next Tuesday.

Mr. *Ritchie* thinks if it were made clear estates were going to pay wages, those in control of Government funds would be prepared to make larger advances.

The Hon. Mr. *Skinner* agrees to the modification of his motion, as suggested by Mr. Macfadyen, and would therefore now formally propose that:

“This Association strongly recommends the payment on September 5th of the balance of any July wages then still due to coolies and expects that it will be possible to pay the August wages by September 26th and to resume the payment of wages in accordance with section 70 of the Labour Code as from October 8th 1914.”

The Hon. Mr. *Macfadyen* seconds this motion, which is put to the meeting and declared carried by 24 to 7.

Mr. *Barbour* proposes that Government be urged to place at the disposal of those estates, who are unable to pay labourers' July wages, a sum sufficient to cover July wages against security.

He points out that estates would probably have at least a fortnight's rubber in hand now, and would have another fortnight's stock before September 5th. Why should not they stock it with Government and get the 9d. per lb., which would be ample to place them in funds. He explained the steps taken in Malacca, resulting in the constitution of a “Planters' Relief Fund,” a board of planters recommending the advances to the Resident, which was working well.

The Hon. Mr. *Skinner* seconds Mr. Barbour's proposal and asks if in Negri Sembilan and Perak similar committees had been formed to help the Resident to arrive at his decisions.

Mr. *Farquharson* says one had been formed in Negri Sembilan, but the Government supply of money was very very short, and they

were only providing sufficient sums to enable estates to feed their coolies. From what the Resident of Negri Sembilan told him that was as far as they were prepared to go.

Mr. *Tylden-Patterson* understands, in Perak, the 30 cents a lb. was purely an advance against remittances, in making which the Resident of Perak had appointed two gentlemen to assist him.

The Hon. Mr. *Macfadyen* observes the amount of money Government had been able to earmark for the relief for planters was very small, and the administration of that money had been left entirely and absolutely to the discretion of the Residents. So far as it was possible to influence the Government in the matter, he could assure them that since the beginning of the crisis pressure had been continually brought to bear on Government to increase the amounts and make the funds more elastic, and no opportunity would be lost of continuing to apply for that. He did not think planters as a whole could count upon any material relief, because he did not believe Government were in a position—though they would be willing if they were in a position—to extend any material relief. He also did not think anyone there was in a position to promise that Government would interfere with the complete discretion of Residents; but he would of course, with Mr. Skinner, undertake to represent very strongly to Government the cases of such estates, as Mr. Barbour's motion referred to.

Mr. Barbour's proposal is then put to the Meeting and carried unanimously.

3. MADURA CO., LTD.

The Chairman explains that a strong and influential Committee had been appointed, but since all immigration had been stopped for the time being, the whole matter had of course been dropped.

4. DRESSERS ON ESTATES.

The *Secretary* reads the following correspondence:—

“Kuala Lumpur, 3rd July, 1914.”

“The Principal Medical Officer, F. M. S.,
Kuala Lumpur.”

“Sir,

I have the honour to inform you that at the last meeting of this Association, held on the 28th ulto. the registration by Government of all dressers qualified to take charge of Estate Hospitals was discussed, as also the desirability of such dressers receiving a Govt. certificate of competency; and I was instructed to submit these matters to you.”

“I have, etc.,
(Sgd.) H. C. E. Zacharias,
Secretary.”

Kuala Lumpur, 6th July, 1914."

" ESTATE DRESSERS—REGISTRATION AND ISSUE OF
CERTIFICATES OF COMPETENCY BY GOVT."

" Sir,

I have the honour to acknowledge receipt of your letter of July 3rd. Unfortunately I was not present when the matter was discussed (no notice of meeting was sent to me) therefore I do not know exactly what the Association desires Government to do. Would you kindly see me and explain the subject fully or else send me more details in a letter and then I shall be very pleased to do what I can in the matter."

" I have, etc.,

(Sgd.) C. Lane Sansom,

Principal Medical Officer, F. M. S."

" The Secretary,

The Planters' Association of Malaya,

Mr. *Tylden-Patterson* illustrates the difficulty of relying on testimonials.

Dr. *Sansom* reminds the meeting that the difficulty of getting dressers on estates had been recognized by his department, and he had some time ago suggested that they would train as many dressers as the planting community liked to send them and would distribute them to estates. In not a single case, however, had that offer been taken advantage of. As to keeping a register, he was not prepared to put indiscriminately on a register all applicants. The keeping of a register of men trained locally would be quite a simple matter, and they would be quite ready to keep that. He still thought the wisest thing they could do was to send dressers to be trained. Government could pride itself now on turning out dressers thoroughly trained. On the other hand, the broadcast distribution of Diplomas, as had also been suggested, he considered a very unwise step to take, as it was one particularly open to abuse.

5. BATAVIA EXHIBITION.

The Secretary reads the following correspondence:—

" Singapore, 21st July, 1914."

Secretary, The Planters' Association of Malaya,
Kuala Lumpur."

" Dear Sir,

RE P. A. M. CUP.

Referring to former correspondence, I very much regret to have to inform you that notwithstanding the fact that the Dutch Government have sent a special representative from the Govern-

ment Rubber Testing Station at Delft to interview Dr. Schidrowitz with regard to the proposed R. G. A. tests, the Exhibition Committee have not been able to ascertain the particulars of the tests in question. This Committee should be very pleased to hear from your Association whether in view of this you would be willing to modify the conditions of the P. A. M. Cup. I am instructed to draw your attention to page 19 of the Notes No. I issued by the Exhibition Committee under the heading "Manner of Tests." Perhaps it could be arranged that the conditions of the P. A. M. Cup could be altered accordingly.

A prompt reply to this letter would be necessary in view of the fact that I expect to receive the samples on or before the 1st of August next, and before that date the proposed exhibitors must be informed of the alteration of the conditions for the P. A. M. Cup, so as to give them an opportunity of withdrawing their samples from the competition."

"Yours faithfully,

(Sgd.) W. E. van Rynberk,

Hon. Secretary, The Singapore Sub-committee,
I. R. C. E., Batavia, 1914."

"Kuala Lumpur, 30th July, 1914."

"W. E. van Rynberk Esq.,
Singapore."

"Dear Sir,

I thank you for your favour of the 21st inst., which I have submitted to the Standing Committee of this Association.

As a result I am instructed to submit the following five rules for testing rubber entered for competition for the P. A. M. Cup at the forthcoming Batavia Congress:

1. The samples to be mixed with Sulphur only, the vulcanized rubber to contain 10 per cent. of sulphur.

2. The samples to be cured in an autoclave steam press, at a temperature of 135°C, and for periods varying from half an hour to four hours if necessary.

3. The samples to be tested for tensile strength and elongation, such tests to be carried out on the Schopper or other suitable machine; the tests to be carried out on rotating ring samples which shall be cut or stamped from the vulcanised specimens.

4. The "optimum cure," *i.e.* the period required for vulcanising which gives the highest figures in the mechanical tests on the vulcanised samples, will be considered to be the correct cure for each sample.

5. The product of the figures obtained for breaking strain per unit of cross section and elongation at breaking point at optimum cure time to be taken as the number of marks earned by each sample tested.

In connection with this Cup, I should like to enquire, whether I am to purchase the trophy here or whether I may leave it to the Congress Authorities at Batavia, to buy one for us. If the latter course is agreeable to you I shall have pleasure in forwarding you a draft on Batavia for Fl. 600, on hearing from you to that effect."

"Believe me, etc.,
(Sgd.) H. C. E. Zacharias,
Secretary."

Mr. F. G. Harvey says it would interest members to know that all exhibits from the Peninsula were still at Singapore and a decision was being awaited from Batavia as to whether the Exhibition and Congress was to be given up altogether or merely postponed, and if so for how long. In the former case exhibits would of course be returned to owners.

6. INDIAN IMMIGRATION COMMITTEE.

The *Ag. Controller of Labour* explains to the Meeting the actions that have been taken by the Indian Immigration Committee in the matter of Assessment on Tamil labour, in view of the temporary stoppage of immigration from India. The Committee had recommended that the assessment rate for the fourth quarter should be fixed at 50 cents instead of \$2. It was not possible to afford any relief to employers in respect of the assessment payable now and in the next quarter in respect of the second and third quarters, as that had already been fixed by law at \$2, and the Committee had no power under the Enactment to vary it. It was hoped, however, that the very material reduction recommended for the fourth quarter would prove an adequate compensation for the loss involved in the temporary cessation of recruiting. Whenever it is possible to start recruiting again, the Fund will be in a position to meet all the usual expenses, and the recruiting allowances recommended for the fourth quarter are at the rate of \$4. Should it prove necessary to extend the prohibition of recruiting beyond three months, the Committee will consider what further relief can be given to subscribers to the Fund.

7. AGRICULTURAL DEPARTMENT.

Mr. *Eaton* reads a short paper on the object and working of the Vulcanizing Plant and Rubber Testing Station.

8. BAGAN DATOH DISTRICT.

The Secretary reads the following correspondence:—

"Kuala Lumpur, 1st July 1914."
"The Hon.
The Chief Secretary, F. M. S.,
Kuala Lumpur."

" Sir,

" BAKAN DATOH DISTRICT."

I have the honour to confirm my letters of April 30th and June 13th, to which I am as yet without a reply, and to inform you that at a Meeting of this Association held on June 26th the following resolution was passed unanimously:—

" That this Association desires to press upon Government
 " (1) the urgency of the various matters referred to at an
 " interview granted by the Chief Secretary to a Sub-Committee
 " of the Association on June 13th and in a letter of the same
 " date, signed by the Chairman; and (2) the particular im-
 " portance of improving transport, postal & telegraph facilities
 " in Bagan Datoh District in the immediate future."

" I have, etc.,
 (Sgd.) H. C. E. Zacharias,
 Secretary."

" Kuala Lumpur, July 7th, 1914."

" No: 37 in 3703/1914."

" Sir,

With reference to your letter of the 13th June on the subject of the rat pest at Bagan Datoh I am directed to forward for the information of your Association a copy of a letter addressed to the Director of Agriculture on this subject."

" I have, etc.,
 (Sgd.) A. Caldecott,
 f. Ag. Under Secretary, F. M. S."

" The Hon. Mr. E. Macfadyen,
 Chairman, Planters' Association of Malaya,
 Kuala Lumpur."

" Kuala Lumpur, 13th July, 1914."

" Under Secretary, F. M. S.,
 Kuala Lumpur."

" Sir,

I have the honour to acknowledge receipt of your letter 37/3703, addressed to the Chairman, and to thank you for its contents.

At the same time I am instructed to express a hope that the other matter, viz: drainage, discussed with the Honourable the Chief Secretary at the interview of the 13th ulto., is receiving the same prompt attention."

" I have, etc.,
 (Sgd.) H. C. E. Zacharias,
 Secretary."

Mr. *Lawford* would add, as regards the drainage question, that he had received a letter giving the planters six weeks' time, in which to accept payment, as offered by the Government. He would still urge that payment should be made on the basis of the actual cost of such drains and not, as proposed, on a valuation.

As for the Agricultural Inspector, Mr. Noek had arrived and had commenced work, but unfortunately they were just now at the end of what they called their rat season, and the rats were disappearing very fast. Previously, 94,000 rats had been killed on five estates alone.

Mr. *Macfadyen* points out, as to the drainage matter, that the Chief Secretary had promised sympathetic consideration, but the present crisis had necessarily deferred that. He would in the circumstances recommend planters to accept without prejudice such money as was offered.

As regards the Rat Pest, it was certainly gratifying to hear that the Government had made a start.

9. ABSCONDERS.

The *Secretary* reads the following correspondence:—

“Kuala Selangor D. P. A.”

Bukit Cheraka,

“Jeram, 30th June, 1914.”

“The Secretary,

P. A. M.,

Kuala Lumpur.”

Dear Sir,

With regard to the matter of procuring warrants for the arrest of bolted coolies which was referred to the Standing Committee to go into, I should like to get a ruling as to who is the Manager's authorized agent who can procure a warrant, as defined in the Labour Code.”

“Yours faithfully,

(Sgd.) J. M. Booth,

Hon. Sec., K. Selangor D. P. A.”

“Kuala Lumpur, 3rd July, 1914.”

“J. M. Booth Esq.,

Hon. Sec., Kuala Selangor D. P. A.,

Bukit Cheraka, Jeram.”

“Dear Sir,

I thank you for your favour of the 30th ulto. re *Absconders*. As regards your question, I am afraid I do not quite understand the point, on which you desire a ruling. May I point out, that, if any offence for which the perpetrator can be arrested, is committed and the alleged culprit's arrest is desired, all that is needed,

is for information to be laid. Such information can of course be laid by any person and there is no provision anywhere restricting such right in the case of offences against § 229, d of the Labour Code to Employers; as defined in § 4 of the said code. The information must of course be of such a nature as to convince the magistrate applied to of the propriety of issuing a warrant. Arrests effected under § 237 by officers of the Labour Department would be guided by analogous considerations.

I shall be glad to hear further from you in this matter, if I have in any way misunderstood the point you wish to raise, and in the meantime beg to remain,

Yours faithfully,
(Sgd.) H. C. E. Zacharias,
Secretary."

"Kuala Selangor D. P. A."

Bukit Cheraka Estate,

Jeram, July 22nd, 1914."

"The Secretary,

P. A. M.,

Kuala Lumpur."

"Dear Sir,

Absconders. I thank you for your information with regard to the procuring of warrants for arrest of bolted coolies. The Kapar D. P. A. have now got a ruling from the District Officer, Klang, to the effect that "any person with a letter from the Manager knowing the facts can procure a warrant for arrest of bolted coolies." This is entirely satisfactory and meets our demands."

"Yours faithfully,

(Sgd.) J. M. Booth,

Hon. Sec., K. Selangor, D. P. A."

Mr. *Irving* is afraid that the matter was not satisfactory at all. The point he had wanted to raise, was not as to who could obtain a warrant, but rather as to the time taken in obtaining it.

The whole difficulty seemed to him to rest on the fact that District Officers had magisterial authority in their own district only. If their appointment was made for the whole State, a material advantage would have been gained. He did not wish to detain the Meeting any longer but suggested that the matter be referred to the Standing Committee.

Agreed to.

Mr. *Campbell* would again raise the question of coolies absconding from Malacca to Johore, reminding his hearers that this was not yet an extraditable offence. The Johore Government were willing, but the S. S. Government refused to treat absconding as

such. He now quoted figures showing one Malacca Estate had lost 69 absconders in July, 47 in June and 44 in May, or 160 in three months. Another Estate lost 46 in July and still another 20. He proposes that the matter be again pressed as strongly as possible on the Colonial Government.

Mr. *Barbour* says men came round in motor cars and collected coolies, and as soon as they got to Muar they just laughed at Malacca Estate Managers.

He begged to second Mr. Campbell's motion, which is then put to the meeting and passed unanimously.

10. MANAGERS' AND ASSISTANTS' REGISTER.

The *Secretary* explains the steps taken by the Standing Committee and places on table form of Register. Twenty names had so far been registered and copies of Register would be sent to any employer expressing a wish to that effect.

11. RAIL FREIGHT REDUCTIONS.

Mr. *Mooijart* says that he had collected certain facts and figures and would be glad if these could be referred to the Standing Committee.

Agreed to.

12. NEWSPAPER AGITATION.

Mr. *Macfadyen* remarks that the pamphlet containing Mr. Ambikapat Rai's reply to the Indian newspaper statements as to the treatment of Indian coolies in the F. M. S., had been sent out together with the last copy of the *Agricultural Bulletin*. The *Indian Review*, in which the original calumnies were published, had also been induced to publish a boiled-down edition of the pamphlet. Altogether he thinks he might say that the steps taken were satisfactory so far as they had gone. (Applause.)

13. CORPORATIONS DUTY DRAFT ENACTMENT.

The *Secretary* informs the Meeting that he had taken legal opinion on the point, as to how the Benevolent Fund would be affected by this Bill.

Mr. *Macfadyen* says it was obvious that as the Bill stood, the Benevolent Fund would have to pay a 3% tax on all grants made outside the Peninsula. There seemed little reason for the whole Bill, but in any case they would do well to protest against its application in respect of their Benevolent Fund.

Mr. *Jarvis* proposes, Mr. *More* seconds and it is carried unanimously that the Chief Secretary be urged to omit the words "within the Federated Malay States or the Colony" in § 3, b.

14. WATER HYACINTH DRAFT ENACTMENT.

Mr. *Macfadyen* draws attention to § 8 of this Bill, which had nothing to do with Water Hyacinth, but included any noxious plant notified to be such by the Chief Secretary. It seemed a very illogical way of dealing with this matter.

15. L. C. BROWN TESTIMONIAL.

The *Secretary* reports that there remained a balance of \$94.81 due to Messrs. Pritchard for the Cup presented to Mr. L. C. Brown.

Mr. *Tayler* proposes, *Major Fox* seconds and it is agreed to that this sum be paid out of P. A. M. funds.

The Meeting terminates at 12.30 p.m.

H. C. E. ZACHARIAS,
Secretary.

DEPARTMENT NOTES.

Mr. D. H. Grist, Agricultural Instructor, Department of Agriculture, F. M. S., arrived at Kuala Lumpur and assumed his duties on 30th July, 1914. (Vide A. B. Vol. ii, No. 11 p. 311.)

Mr. J. Grantham, 3rd Assistant Agricultural Chemist, Department of Agriculture, F. M. S. arrived at Kuala Lumpur and assumed his duties on 15th October, 1914 (vide A. B. Vol. ii, No. 12 p. 341).

Mr. W. N. C. Belgrave has been appointed as 2nd Assistant Mycologist, Department of Agriculture, F. M. S. Kuala Lumpur

EDITORIAL NOTE.

It is regretted that, owing to the local difficulties caused by the present international situation, the publication of the *Agricultural Bulletin*, F. M. S., had to be suspended for two months. There will be no issues for August and September, 1914. The present issue for October, 1914 will commence the third volume.

An index to Volume II is in the press and will shortly be issued to all subscribers.

L. L. B.

FEDERATED MALAY STATES.

*Comparative Statement of Cultivated Rubber Exported, with Value and duty Collected Thereon,
During the Years 1914 and 1913.*

Destination.	Exported during June, 1914.		Previously, during the year.		Total export during the year.		Export during similar period of previous year.		Increase.		Decrease.		Value of rubber exported, 1914, 1914, to date.		Duty collected, 1914, 1914, to date.	
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	\$	\$	\$	c.
Straits Settlements ...	1,439.83	6,117.26	7,557.09	4,684.75	2,872.34	...	13,304,024	330,719	99	9,288,366	232,209	15				
United Kingdom ...	727.29	4,473.27	5,200.56	4,895.81	304.75	...	1,161,499	29,037	47	413,247	10,331	17				
Continent of Europe...	93.30	540.75	640.05	609.63	30.42	...	413,498	10,337	45							
Ceylon ...	39.67	312.25	351.92	293.17	58.75	...										
Other Countries ...	...	100.27	100.27	Nil	100.27	...										
Total ...	2,306.09	11,543.80	13,849.89	10,483.36	3,366.53	...	24,580,634	612,635	23							

KUALA LUMPUR,
6th July, 1914.

H. W. FIRMSTONE,
Acting Commissioner, Trade and Customs, F.M.S.

FEDERATED MALAY STATES.

Comparative Statement of Cultivated Rubber Exported, with Value and Duty Collected Thereon, during the Years 1914 and 1913.

Destination.	Exported during July, 1914.	Previously.	Total export during the year.	Export during similar period of previous year.	Increase.	Decrease.	Value of rubber exported, 1914.	Duty collected, 1914, to date.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	\$	\$ c.
Straits Settlements ...	2,494.93	7,557.09	10,052.02	5,042.63	5,009.39	...	15,704,455	390,456 43
United Kingdom ...	233.09	5,200 56	5,433.65	6,071.55	...	637.90	11,250,175	281,254 37
Continent of Europe...	161.73	640.05	801.78	791.57	10.21	...	1,426,668	35,666 70
Ceylon ...	81.56	351.92	433 48	358.95	74.53	...	543,193	13,579 82
Other Countries ..	...	100.27	100.27	...	100.27	...	413,498	10,337 45
Total ...	2,971.31	13,849.89	16,821.20	12,264 70	5,194.40	637.90	29,337,989	731,294 77

KUALA LUMPUR,

12th August, 1914.

H. W. FIRMSTONE,

Acting Commissioner, Trade and Customs, F.M.S.

FEDERATED MALAY STATES.

*Comparative Statement of Cultivated Rubber Exported, with Value and Duty Collected Thereon,
During the Years 1914 and 1913.*

Destination.	Exported during August, 1914.	Previously	Total export during the year.	Export during similar period of previous year.	Increase.	Decrease.	Value of rubber exported, 1914.	Duty collected, 1914, to date.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	\$	\$ c.
Straits Settlements ..	1,261.21	7,557.09	8,818.30	6,395.11	2,423.19	...	17,593,313	402,848 88
United Kingdom ...	579.47	5,200.56	5,780.03	6,905.07	...	1,125.04	12,088,097	281,254 37
Continent of Europe ..	...	640.05	640.05	920.81	...	280.76	1,426,668	35,666 70
Ceylon ...	9.40	351.92	361.32	406.75	...	45.43	556,742	13,579 82
Other Countries ...	...	100.27	100.27	...	100.27	...	413,498	10,337 45
Total ..	1,850.08	13,849.89	15,699.97	14,627.74	2,523.46	1,451.23	32,078,318	743,687 22

KUALA LUMPUR,
7th September, 1914.

H. W. FIRMSTONE,
Acting Commissioner, Trade and Customs, F.M.S.

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	TEMPERATURE.			Range	HYGROMETER.			Humidity.	Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.		Mean Wet Bulb.	Vapour Tension.	Dew Point.				
Kelantan, Kota Bharu	...	146.	83.5	92.30	74.73	17.57	80.1	.952	77.8	83%	...	6.37	1.72
Malacca, Durian Daun Hos.	29.863	149.5	83.2	87.	72.	15.	80.	.960	...	86	N.W.	12.52	4.39
N. Sembilan, Dist. Hospital Seremban	...	157.9	80.7	90.4	70.6	19.8	76.5	.837	73.8	80	S.W.	8.72	1.88
" Dist. Hos. K. Pihah	...	153.2	81.5	...	...	...	77.9	.890	75.6	82	...	3.85	.85
" Tampin	...	144.4	81.7	...	...	...	77.2	.845	74.1	78	...	6.54	1.10
" P. Diekson	...	153.7	82.5	87.5	74.7	12.8	78.1	.876	75.4	79	...	11.67	2.50
Pahang, " K. Lipis	...	...	82.1	90.5	72.2	18.3	76.2	...	...	...	...	8.27	4.45
Penang, " Penang	29.854	141.7	83.8	89.7	73.8	15.9	78.2	.893	74.2	77	...	5.82	2.10
Perak, " Taiping	...	108.	83.32	96.	70.	26.	78.11	.894	...	79	...	7.97	2.80
" Ipoh	...	...	82.99	95.	70.	25.	77.52	.873	...	79	...	12.72	3.37
" T. Anson	...	...	83.05	94.	72.	22.	79.45	.956	...	85	...	3.36	1.43
" P. Buntar	...	...	83.16	92.	71.	21.	77.73	.879	...	79	...	6.45	2.60
" The Cottage	...	...	...	...	...	...	...	...	...	...	...	17.54	4.74
Selangor, General Hospital	...	...	...	...	...	...	...	...	...	...	...	...	...
Kuala Lumpur	...	121.6	81.3	88.0	71.4	16.6	78.3	.910	76.3	85	S.W.	9.42	2.59
Dist. Hos. Klang	...	...	82.5	89.5	75.3	14.2	77.9	...	...	...	...	5.57	2.12
" K. Selangor	...	...	...	88.1	74.2	13.9	...	...	...	...	...	6.40	1.77
" Rawang	...	...	...	92.2	72.6	19.6	...	...	...	...	...	13.38	4.47
Singapore, Kandang Kerbau Observatory	29.882	154.4	83.4	87.3	76.0	11.3	78.4	.901	...	79	S.E.	8.75	2.77

DISTRICT.	Mean Barometrical Pressure at 32° Fah.	TEMPERATURE.				HYGROMETER.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
		Maximum in Sun.	Mean Dry Bulb.	Maximum	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.		
Kelantan, Kota Bharu	...	146.	82.5	90.48	74.09	16.38	78.8	.906	76.3	81%	5.19	1.42
Malacca, Durian Daun Hos.	29.855	145.2	82.5	86.3	71.6	14.7	79.8	.965	...	86	7.04	2.40
N. Sembilan, Dist. Hospital Seremban	...	155.4	79.3	88.8	70.9	17.9	76.5	.860	74.6	85	5.33	1.20
" Dist. Hos. K. Piah	...	148.7	80.6	89.3	...	...	77.1	.866	74.7	83	2.17	.58
" Tampin	...	143.7	80.8	89.9	...	...	76.7	.844	74.1	80	6.02	2.08
" P. Dickson	...	146.4	82	87.5	73.6	13.9	77.7	.886	74.8	79	9.56	3.00
Pahang, K. Lipis	...	...	82.	91.3	71.9	19.04	76.4	...	...	...	1.94	1.29
Penang, Penang	29.818	135.	83.7	89.4	74.	15.4	78.3	.880	75.4	77	5.48	3.92
Perak, Taiping	...	108.	83.97	96.	70.	26.	77.80	.871	...	75	2.25	1.02
" Ipoh	...	...	83.38	94.	70.	24.	77.54	.867	...	77	1.75	1.13
" T. Anson	...	...	82.79	94.	70.	24.	78.40	.915	...	83	3.56	1.90
" P. Buntar	...	...	83.02	93.	72.	21.	78.05	.883	...	77	5.84	3.82
" The Cottage	...	...	...	..	...	...	...	...	...	...	17.50	4.74
Selangor, General Hospital	...	...	...	...	...	...	...	...	...	...	...	...
Kuala Lumpur	...	144.1	80.8	90.3	74.6	15.7	77.4	.873	75.1	83	4.58	1.41
" Dist. Hos. Klang	...	...	82.6	89.8	74.1	15.7	80.2	...	...	...	3.95	1.35
" K. Selangor	...	...	...	88.8	74.4	14.4	...	...	...	...	1.87	1.07
" Rawang	...	...	...	92.7	72.4	20.3	...	...	...	...	4.27	2.55
Singapore Kandang Kerbau Observatory	29.877	159.	83.6	90.	72.	18.	77.5	.883	...	78	3.99	1.38

